Claim Amendments

1. (currently amended) A duplexer for use in a communication device, the communication device having

an antenna for conveying communication signals;

a transmit path operatively connected to the antenna for transmitting the signals; and

a receive path operatively connected to the antenna for receiving the signals, said duplexer comprising:

a first coupled resonator device disposed in the transmit path for filtering the signals in the transmit path;

a second coupled resonator device disposed in the receive path for filtering the signals in the receive path; and

a phase shifter disposed in the receive path and operatively connected to the second coupled resonator device, wherein each of said first and second coupled resonator devices comprises:

an input end for receiving the signals in the corresponding path, and an output end for providing filtered signals in the corresponding path;

a first resonator operatively connected to the input end to provide acoustic wave signals indicative of the received signals;

a first delay section, responsive to the acoustic wave signals, for providing delayed acoustic wave signals;

an intermediate resonator having a first end and a second end, responsive to the delayed acoustic wave signals at the first end, for producing at the first and second ends electric signals indicative of the delayed acoustic wave signals for generating further acoustic wave signals at the second end;

a second delay section, responsive to the further acoustic wave signals, for providing ~~proving~~ further delayed acoustic wave signals, the second delay section spaced from the first delay section; and

a second resonator operatively connected to the output end, for providing the filtered signals to the output end responsive to the further delayed acoustic wave signals.

2. (original) The duplexer of claim 1, wherein the phase shifter is disposed between the second coupled resonator device and the antenna.

3. (original) The duplexer of claim 2, further comprising a further phase shifter disposed in the transmit path and operatively connected to the first coupled resonator device.

4. (original) The duplexer of claim 3, wherein the further phase shifter is disposed between the first coupled resonator device and the antenna.

5. (currently amended) The duplexer of claim 3, wherein the first coupled resonator device is disposed between the further phase shifter and the antenna.

6. (original) The duplexer of claim 1, wherein

the input end of the first coupled resonator device comprises two input terminals, and

the output end of the first coupled resonator device comprises two output terminals, and wherein

one of the two input terminals and one of the two output terminals are operatively connected to ground.

7. (original) The duplexer of claim 1, wherein

the input end of the second coupled resonator device comprises two input terminals, and wherein

one of the two input terminals is operatively connected to ground to achieve a single-to-balanced transformation.

8. (currently amended) The duplexer of claim 7 [[1]], wherein

the input end of the first coupled resonator device comprises two input terminals, and

the output end of the first coupled resonator device comprises two output terminals, and wherein

one of the two input terminals and one of the two output terminals are operatively connected to ground.

9. (original) The duplexer of claim 1, wherein the first and second resonators are bulk acoustic wave devices.

10. (original) The duplexer of claim 3, wherein each of the phase shifter and the further phase shifter comprises a transmission line.

11. (original) The duplexer of claim 3, wherein each of the phase shifter and the further phase shifter comprises one or more lump elements.

12. (original) The duplexer of claim 3, wherein the further phase shifter comprises one or more lump elements integrated with the first coupled resonator device.

13. (currently amended) A coupled resonator device, comprising:

an input end for receiving the signals in the corresponding path, and an output end for providing filtered signals in the corresponding path;

a first resonator, operatively connected to the input end to provide acoustic wave signals indicative of the received signals;

a first delay section, responsive to the acoustic wave signals, for providing delayed acoustic wave signals;

an intermediate resonator having a first end and a second end, responsive to the delayed acoustic wave signals at the first end, for producing electric signals at the first and second ends indicative of the delayed acoustic wave signals for generating further acoustic wave signals at the second end;

a second delay section, responsive to the further acoustic wave signals, for providing ~~proving~~ further delayed acoustic wave signals, the second delay section spaced from the first delay section; and

a second resonator, operatively connected to the output end, for providing the filtered signals to the output end responsive to the further delayed acoustic wave signals.

14. (original) The resonator device of claim 13, further comprising a substrate, wherein

the intermediate resonator comprises:

a first electrode disposed on the substrate;

a piezoelectric layer disposed on the first electrode; and

a second electrode disposed on the piezoelectric layer, the second electrode having a first end and a second end, and wherein

the first delay section is disposed on the first end of the second electrode;

the second delay section is disposed on the second end of the second electrode;

the first resonator is disposed on the first delay section; and

the second resonator is disposed on the second delay section.

15. (original) The resonator device of claim 13, wherein each of the first and second resonators comprises a pair of electrodes and a further piezoelectric layer disposed between said pair of electrodes.

16. (original) The resonator device of claim 14, further comprising

an acoustic mirror disposed adjacent to the intermediate resonator, between the first electrode and the substrate.

17. (original) The resonator device of claim 13, wherein each of the first and second delay sections comprises a plurality of dielectric materials.

18. (original) The resonator device of claim 13, wherein each of the first and second delay sections comprises a structure composed of silicon dioxide and tungsten layers.

19. (original) The resonator device of claim 13, wherein the input end comprises two input terminals, and wherein one of the two input terminals is operatively connected to a non-acoustic phase shifting component.

20. (original) The resonator device of claim 19, wherein the other of the two input terminals is operatively connected to ground.

21. (currently amended) The resonator device of claim 13, wherein the first resonator has a first resonant frequency and the second resonator has a second resonant frequency slightly different from the first resonant frequency.

22. (currently amended) A communication device comprising:

an antenna port for conveying communication signals;

a transceiver having a transmit port and a receive port; and

a duplexer comprising:

a first coupled resonator device disposed in a transmit path between the antenna port and the transmit port for filtering the signals in the transmit path;

a second coupled resonator device disposed in the receive path between the antenna port and the receive port for filtering the signals in the receive path; and

a phase shifter disposed in the receive path and operatively connected to the second coupled resonator device, wherein each of said first and second coupled resonator devices comprises:

an input end for receiving the signals in the corresponding path; and an output end for providing filtered signals in the corresponding path;

a first resonator, operatively connected to the input end, for providing acoustic wave signals indicative of the received signals;

a first delay section, responsive to the acoustic wave signals, for providing delayed acoustic wave signals;

an intermediate resonator having a first end and a second end, responsive to the delayed acoustic wave signals at the first end, for producing an electric signals at the first and second ends indicative of the delayed acoustic wave signals for generating further acoustic wave signals at the second end;

a second delay section, responsive to the further acoustic wave signals, for providing ~~proving~~ further delayed acoustic wave signals, the second delay section spaced from the first delay section; and

a second resonator operatively connected to the output end, for providing the filtered signals to the output end responsive to the further delayed acoustic wave signals.

23. (original) The communication device of claim 22, wherein the duplexer further comprises:

a further phase shifter disposed in the transmit path and operatively connected to the first coupled resonator device.

24. (original) The communication device of claim 22, comprising a mobile terminal.

25. (original) The communication device of claim 22, wherein each of the first and second delay sections in the first and second coupled devices comprises a structure composed of silicon dioxide and tungsten layers.

26. (original) The communication device of claim 22, wherein the first coupled resonator device has a single-to-single configuration and the second coupled resonator device has a single-to-balanced transformation.